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Thermo Nutech W.O. No. N9-09-034-7195 DEC 1999

Bechtel Hanford Inc. SDG H0515

#### **Case Narrative**

#### 1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0515 is composed of one liquid (water) sample designated under SAF No. B99-085 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU-QC Sa.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were transmitted to BHI via facsimile on October 1, 1999.

#### 2.0 ANALYSIS NOTES

#### 2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

#### T M A / R I C H M O N D SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact <u>Kevin C. Johnson</u> Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0515</u>

#### SUMMARY DATA SECTION

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Prepared by

Reviewed by

SDG 7195

Contact <u>Kevin C. Johnson</u>

#### REPORT GUIDE

Client Hanford

Contract TRB-SBB-207925

Case no <u>SDG-H0515</u>

#### ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

#### SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

#### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

#### WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

#### METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

#### LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

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SDG 7195

Contact Kevin C. Johnson

# GUIDE, cont.

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

#### ABOUT THE DATA SUMMARY SECTION

#### DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

#### MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

#### DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

#### METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

#### REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>10/02/99</u>

SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact Kevin C. Johnson

#### SAMPLE SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0W9P1	200 East 200 CWI GP-12	WATER		N909034-01	B99-085	B00-085-03	09/01/99 06:30
Method Blank		WATER		N909034-03	B99-085		
Lab Control Sample	•	WATER		N909034-02	B99-085		
Duplicate (N909034-01)	200 East 200 CWI GP-12	WATER		N909034-04	В99-085		09/01/99 06:30

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SAMPLE DELIVERY GROUP H0515

SDG 7195
Contact Kevin C. Johnson

#### QC SUMMARY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

ос ватсн	CHAIN OF	CLIENT SAMPLE ID	MATRIX	\$ SOLIDS	SAMPLE	BASIS AMOUNT	DAYS ST		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7195	B00-085-03	B0W9P1	WATER				09/03/99	2	N909034-01	7195-001
		Method Blank	WATER						N909034-03	7195-003
		Lab Control Sample	WATER						N909034-02	7195-002
		Duplicate (N909034-01)	WATER				09/03/99	2	N909034-04	7195-004

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-OS

Version 3.06

Report date 10/02/99

SAMPLE DELIVERY GROUP H0515

SDG 7195
Contact Kevin C. Johnson

#### PREP BATCH SUMMARY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %		MORE	PLA	nchets :			QUALI- FIERS
Gas 80A	Proportion WATER	al Counting Gross Alpha in Water	6893-149	20.0	1			1	1	1/1	
80B	WATER	Gross Beta in Water	6893-149	15.0	1			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

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SAMPLE DELIVERY GROUP H0515

#### WORK SUMMARY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

CLIENT SAMPLE ID		LAB SAMPLE II	)						
LOCATION	MATRIX	COLLECTED	•		SUF-				
CUSTODY SAF 1	io .	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
B0W9P1	•	N909034-01	7195-001	80A/80		09/27/99	10/01/99	VUN	Gross Alpha in Water
200 East 200 CWI GP-3	.2 WATER	09/01/99	7195-001	80B/80		09/27/99	10/01/99	njv	Gross Beta in Water
B00-085-03 B99-0	85	09/03/99							
Method Blank		N909034-03	7195-003	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
	WATER		7195-003	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
B99-0	85								
Lab Control Sample		N909034-02	7195-002	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
	WATER		7195-002	80B/80		09/27/99	10/01/99	njv	Gross Beta in Water
B99-0	085								
Duplicate (N909034-03	L)	N909034-04	7195-004	80A/80		09/27/99	10/01/99	VLN	Gross Alpha in Water
200 East 200 CWI GP-1	2 WATER	09/01/99	7195-004	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
B99-0	)85	09/03/99							

TEST	SAF No	COUNTS	OF TESTS BY	SAMPLE TYPE CLIENT MORE	re blank	LCS	DUP SPIKE	TOTAL
80A/80 80B/80	B99-085 B99-085	Gross Alpha in Water Gross Beta in Water	EPA900.0 EPA900.0	1	1	1	1 1	4
TOTALS				2	2	2	2	8

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SDG 7195

Contact Kevin C. Johnson

Lab id TMANC
Protocol Hanford

Version Ver 1.0 Form DVD-CWS

Version 3.06

Report date <u>10/02/99</u>

N909034-03

#### METHOD BLANK

Method Blank

SDG	7195	Client/Case no	Hanford	SDG-H0515
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925	
Lab sample id	N909034-03	Client sample id	Method Blank	
Dept sample id		Material/Matrix		WATER
		SAF No	B99-085	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TE <b>ST</b>
Gross Alpha	12587-46-1	-0.010	0.46	1.0	3.0	Ū	80A
Gross Beta	12587-47-2	0.064	1.4	2.4	4.0	υ	80B

200 Area Src chr 200-CW-1 OU-QC Sa

QC-BLANK	31870

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/02/99</u>

SAMPLE DELIVERY GROUP H0515

N909034-02

# LAB CONTROL SAMPLE

Lab Control Sample

SDG 7195	Client/Case no Hanford	SDG-H0515

SDG	7195	Client/Case no	Hanford	SDG-H0515
Contact	Kevin C. Johnson	Case no	TRB-SBB-207925	
	•			
Lab sample id	N909034-02	Client sample id	Lab Control Sample	<u></u>
Dept sample id	7195-002	Material/Matrix		WATER
		SAF No	B99-085	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha Gross Beta	71.1 84.0	5.3 3.8	1.4	3.0 4.0		80A 80B	72.0 83.0	2.9	99 101	68-132 75-125	80-120

200 Area Src chr 200-CW-1 OU-QC Sa

QC-LCS 31869

LAB CONTROL SAMPLES
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SAMPLE DELIVERY GROUP H0515

N909034-04

DUPLICATE

BOW9P1

SDG 7195		Client/Case no <u>Hanford</u> <u>SDG-H0515</u>
Contact <u>Kevin C. Johnson</u>	on	Case no TRB-SBB-207925
DUPLICATE	ORIGINAL	
Lab sample id <u>N909034-04</u>	Lab sample id <u>N909034-01</u>	Client sample id BOW9P1
Dept sample id 7195-004	Dept sample id <u>7195-001</u>	Location/Matrix 200 East 200 CWI GP-12 WATER
	Received 09/03/99	Collected 09/01/99 06:30
		Custody/SAF No <u>B00-085-03</u> <u>B99-085</u>
	Received <u>09/03/99</u>	

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD	3σ PROT
Gross Alpha Gross Beta	-0.159 1.32	0.28	0.75 2.4	3.0 4.0	u u	80A 80B	0.179 0.089	0.42	0.78	U U	-	

200 Area Src chr 200-CW-1 OU-QC Sa

DUPLICATES

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N909034-01

•

DATA SHEET

BOW9P1

į.	7195	Client/Case no	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id		Client sample id	B0W9P1
Dept sample id	7195-001	Location/Matrix	200 East 200 CWI GP-12 WATER
Received	09/03/99	Collected	09/01/99 06:30
		Custody/SAF No	B00-085-03 B99-085

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.179	0.42	0.78	3.0	U	80A
Gross Beta	12587-47-2	0.089	1.2	2.1	4.0	Ŭ	80B

200 Area Src chr 200-CW-1 OU-QC Sa

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-DS</u>

Version <u>3.06</u>

Report date <u>10/02/99</u>

SAMPLE DELIVERY GROUP H0515

#### METHOD SUMMARY

GROSS ALPHA IN WATER GAS PROPORTIONAL COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0515

RESULTS

	LAB	RAW SUF	·-			
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	Gross P	lpha	
•			•	•		 
Preparation batch 6893-	149					
BOW9P1	N909034-01	80	7195-001	U		
BLK (QC ID=31870)	N909034-03	80	7195-003	U		
LCS (QC ID=31869)	N909034-02	80	7195-002	ok		
Duplicate (N909034-01)	N909034-04	80	7195-004	-	U	
		**	· · · · · · · · · · · · · · · · · · ·			 
Nominal values and limi	ts from metho	od F	DLs (pCi/L)	3.0		
200 Area Src chr 200-CW	-1 OU-QC Sa					

METHOD PERFORMANCE

Test 80A Matrix WATER

Contact Kevin C. Johnson

SDG <u>7195</u>

	LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	epp	COUNT	PWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/L	ŗ	FAC	TION	mg	ŧ	min	keV	KeV	HELLD	PREPARED	YZED	DETECTOR
Preparation batch 6893-1	 149 2øpr	ep er	ror 20	).0 % R	eference	Lab 1	Noteboo	k 6893	pg.:	149						
B0W9P1	N909034-01	80		0.78	0.300			<u> </u>		100			26	09/23/99	09/27	GRB-114
BLK (QC ID=31870)	N909034-03	80		1.0	0.300			37		100				09/23/99	09/27	GRB-116
LCS (QC ID=31869)	N909034-02	80		1.4	0.300			38		100				09/23/99	09/27	GRB-115
Duplicate (N909034-01) (QC ID=31871)	N909034-04	80		0.75	0.300			1		100			26	09/23/99	09/27	GRB-116
Nominal values and limit	ts from metho	»d		3.0	0.300			5-15	0	100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-120	Gross Alpha and Gross Beta in Environmental Water,
		rev 2

AVERAGES ± 2 SD	MDA	0.98	±	0.60
FOR 4 SAMPLES	RESIDUE .	19	±	42

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Lab id TMANC Protocol Hanford Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 10/02/99

SAMPLE DELIVERY GROUP H0515

Test 80B Matrix WATER
SDG 7195
Contact Kevin C. Johnson

#### METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### RESULTS

Preparation batch 6893-	149				
BOW9P1	N909034-01	80	7195-001	υ	
BLK (QC ID=31870)	N909034-03	80	7195-003	U	
LCS (QC ID=31869)	N909034-02	80	7195-002	ok	
Duplicate (N909034-01)	N909034-04	80 .	7195-004	-	υ

#### METHOD PERFORMANCE

	LAB		SUF-	MDA	~		DILU-								ANAL-	nnanaman
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/L	L	FAC	TION	mg	*	mın	keV	KeV	HELL	PREPARED	YZED	DETECTOR
Preparation batch 6893-1	l49 2σ pr	ep er	ror 15	.0 % 1	Reference	Lab l	Noteboo!	k 6893	pg.	149						
BOW9P1	N909034-01	80		2.1	0.300			1		100			26	09/23/99	09/27	GRB-114
BLK (QC ID=31870)	N909034-03	80		2.4	0.300			37		100				09/23/99	09/27	GRB-116
LCS (QC ID=31869)	N909034-02	80		1.9	0.300			38		100				09/23/99	09/27	GRB-115
Duplicate (N909034-01)	N909034-04	80		2.4	0.300			1		100			26	09/23/99	09/27	GRB-116
(QC ID=31871)																
Nominal values and limit	ts from metho	od.		4.0	0.300			5-15	0	100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-120	Gross Alpha and Gross Beta in Environmental Water,
		rev 2

AVERAGES ± 2 SD	MDA	2.2_	±	0.49
FOR 4 SAMPLES	RESIDUE	1.9	±	42

METHOD SUMMARIES

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Lab id TMANC
Protocol Hanford
Version Ver 1.0

Form DVD-CMS Version 3.06

Report date <u>10/02/99</u>

SDG 7195 Contact Kevin C. Johnson

#### REPORT GUIDE

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0515

#### SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- \* LAB SAMPLE ID is the lab's primary identification for a sample.
- \* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- \* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- \* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.
  - QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- \* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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SDG 7195 Contact Kevin C. Johnson

#### REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- \* The preparation batches are shown in the same order as the Method Summary Reports are printed.
- Only analyses of planchets relevant to the SDG are included.
- \* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- \* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SDG <u>7195</u> Contact <u>Kevin C. Johnson</u>

#### REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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Lab id <u>TMANC</u>

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Version <u>3.06</u>

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REPORT GUIDE

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

#### DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- \* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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SDG <u>7195</u>

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Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0515

#### DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

\* An MDA is underlined if it is bigger than its RDL.

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Client	<u>Hanford</u>
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#### DATA SHEET

- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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SUMMARY DATA SECTION
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 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-RG

 Version
 3.06

 Report date
 10/02/99

#### T M A / R I C H M O N D SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact Kevin C. Johnson

#### REPORT GUIDE

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0515

#### LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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SUMMARY DATA SECTION
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SDG <u>7195</u>

Contact Kevin C. Johnson

#### REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

\* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

\* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

\* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- \* The second limit for the RPD is the larger of:
  - 1. A fixed percentage specified in the protocol.

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SAMPLE DELIVERY GROUP H0515

SDG <u>7195</u> Contact <u>Kevin C. Johnson</u>

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0515</u>

#### DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

\* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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SDG <u>7195</u> Contact Kevin C. Johnson

#### REPORT GUIDE

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0515

#### MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

\* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

\* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  - The errors of the two RESULTs, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits

Lab id TMANC
Protocol Hanford

Version <u>Ver 1.0</u>

Form DVD-RG

Version 3.06

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SDG 7195 Contact <u>Kevin C. Johnson</u>

n G

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

\* The recovery is underlined (out of spec) if it is outside either of these ranges.

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SDG	7195			
Contact	Kevin	C.	Johnson	

#### REPORT GUIDE

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0515

#### METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

\* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

\* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

\* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>10/02/99</u>

SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact <u>Kevin C. Johnson</u>

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0515

#### METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Prepareation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact Kevin C. Johnson

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0515</u>

#### METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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Lab id <u>TMANC</u>

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SAMPLE DELIVERY GROUP H0515

SDG 7195 Contact Kevin C. Johnson

GUIDE, cont.

Client	Hanford
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Case no	SDG-H0515

#### METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Collector Doug Bowers/Brent Porter		Comp	any Contact is Cearlock	Telephor 372-9:	ne <b>No.</b> 574		]	Project Coordi TRENT, SJ	r	rice Code	7N	Data Tu	
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa Sampling Location 200 East 200 CW1 GP			ing Location East 200 CW1 GP-61	1 % 70 9-1-98 E			SAF No. 399-085		s Da	405 I	S 45	Day	
ce Chest No.			Logb <b>ook No.</b> 1511		<del></del>		1	Method of Ship Federal Expr	oment ess			`	
hipped To TMA/REERA	·) ~29		Property No. -990244					Bill of Lading/	Air Bill No.	4234	5796	290	68
						,	,	COA D	OCW	1167	11		·
POSSIBLE SAMPLE HAZA	RDS/REMARKS		Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH	HCl to pH <2 Cool 4C	HNO3 to pH <2			
•			Type of Container	P	P	Р.	aG	G/P	aGs*	P			
Special Handling and/or Stor	age		No. of Container(s)  .Volume	1 500mL	l 1000mL	1 1000mL	2 1000mI	2 1000mL	3 40mL	3 500mL			
	SAMPLE ANAI	.ysis	,	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA 8270A (TC		VOA - 8260A (TCL): VOA - 8260A (Add- On) (1- Propanol, Ethanol)	See item (2) in Special Instructions.			   
Sample No.	Matrix *	Sample Date	Sample Time	429									
OW9P0	Water	9-1-99					 						
0W9P1	Water	9-1-99	0630		<u> </u>			+ x ·			<u> </u>		_
CHAIN OF POSSESSION	:	Sign/Prit	nt Names	<u> </u>	See C		y comment	s on SAF for spec			<u> </u>	Matrix Soil Water	<u> </u>
linquished By Do43 Bower  Do49 Bower  Slinquished By  REF 1 A 9219	Date/Time  9 -/-99//200  Date/Time  /3 @  Date/Time	Received By Received By SJOIGHTE Received By	1 A 9.1.99 Dr. Inl. 9.2.	te/Time  te/Time  130  te/Time	(Wate (2) IC Seleni Vanad	r) - 9040 CP Metals - 601 ium, Silver); IC lium, Zinc)	10A (Superi CP Metals -	e, Fluoride, Nitrat trace) (Arsenic, B 6010A (Supertra	arium, Cadmi ce Add-On) (G	um, Chromium Copper, Nickel	n, Lead,	Vspor Other Solid Other Liquid	ı
alinquished By SJSD 9  SIGALE SJSD 9  Slinquished By 4:	299 1300 600 Date/Time 9-3-99	Received By		-2-00				Bed ar		COC,			
ABORATORY Received By SECTION				Tit	le							Date/Time	
INAL SAMPLE Disposal Me	al and					Dîspos	sed By				D	ate/Time	

## SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT
Client: Bechte Mauford Inc Date/Time received 9-3-99 11:00
COC NO. B99-085-03
Container I.D. No. #207/ Requested TAT (Days) 45 P.O. Received Yes [ ] No [M]
NSPECTION
1. Custody seals on shipping container intact? Yes [ No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [ M No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [ W No [ ] N/A [ 1]
4. Custody seals on sample containers dated & signed? Yes [V] No [ ] N/A [ ]
5. Cooler Temperature: Packing material is: Wet [ ] Dry [ 1
6. Number of samples in shipping container:
7. Number of containers per sample: 2 (Or see CoC)
8. Paperwork agrees with samples? Yes [ 1 No [ ]
9. Samples have: Tape [ Hazard labels [ ] Rad labels [ ] Appropriate sample labels [ ]
10. Samples are: In good condition [ Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies:
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date
14. Received by Mi Coldenherg Date: 9-2-99 Time: 11:00
LOGIN
TNU W.O. No Client W.O. No
PROGRAM MANAGER
Sample holding times exceeded? Yes (   No (
Client Notified: Name Date/time

## Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-085

**W.O.** #: 10985-001-001-9999-00

**RFW#**: 9909L006

Date Received: 09-03-99

**SDG#**: H0515 **SAF#**: B99-085

#### INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite, Phosphate and pH which were received past hold.
- 4. The cooler temperature was recorded on the chain-of-custody.
- 5. The method blanks were within method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicate for Sulfide was within the 20% RPD control limit.
- 8. The replicate analyses were within the 20% RPD control limit with the exception of Chloride which was outside the limit.
- 9. Matrix quality control analyses were not performed for Ammonia and Nitrate Nitrite. These analyses will be performed and data will be submitted as required by the client.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

njp\i09-006

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

## Recra LabNet Philadelphia

## WET CHEMISTRY

## METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

, ADAHODO ODO.	EDA /600	SW846	OTHER
cidity	EPA /600 305.1	244040	<u>OTHER</u>
Alkalinity Bicarbonate Carbonate	310.1		
OD	405.1		5210B (b)
⊃n Chormatography.	403.1		
Bromide Chloride Fluoride	<b>/</b> 300.0	9056	
Nitrite Nitrite Phosphate	300.0	9056	
Sulfate Formate Acetate Oxalate	300.0	9056	·
hloride	325.2	9251	
Chorine, Residual	330.5 (mod)		
Syanide, Amenable to Chorination	335.2	9010 <b>B</b>	
Syanide, Total	335.2	9010B 9014	4 ILMO4.0 (e)
Zyanide, Weak Acid Dissociable			412 (a) 4500CN-I (b
COD	410.4(mod)		5220C (b)
Color	110.2		
Corrosivity by Coupon .	_	1110(mod)	·
Chromium VI		7196A	3500Cr-D (b)
Fluoride	340.2	<del></del>	4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
odide			ASTM D19P202 (1)
Surfactant			
✓ Nitrate-NitriteNitrateNitrite	353.2		
Ammonia	350.3	•	
Total Kjeldahl Organic Nitrogen	351.4	22.5	
Total Organic Inorganic Carbon	415.1	9060	
Oil & Grease	413.1	9070	•
√ pH pH; paper	150.1	✓ 9040B — 9041A	3
Petroleum Hydrocarbons, Total Recoverable	418.1	420.2 9065 9	066
Phenol Carlo Black hada		420.2 9065 9	4500-P B C
OrthoTotal Phosphate	365.2	•	210A (a) 2520 (b)
Salinity Settleable Solids	160.5	,	21011 (a) 2520 (b)
Sulfide		376.2 \( \sqrt{9030B/90}	34 (acid soluble)
Reactive Cyanide Sulfide	570.1	Section 7.3	, (usia solutio)
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	9038	
Specific Conductance	120.1	9050A	
Specific Gravity	<del></del>		D5057-90 213E (a)
Synthetic Precipitation Leach		1312	<del>-</del> -
TotalDissolvedSuspendedSolids	1601	.23	
Total Organic Halides	450.1	9020B	
Turbidity	180.1		
Volatile Solids:			
TotalDissolvedSuspended	160.4		
Other:		Method:	

# Recra LabNet Philadelphia METHOD REFERENCES AND DATA QUALIFIERS

## **DATA QUALIFIERS**

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

## <u>ABBREVIATIONS</u>

MB = Method or Preparation Blank.

MS = Matrix Spike. .

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

- ASTM Standard Methods.
- 2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. <u>Test Methods for Evaluating Solid Waste</u> (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. <u>Standard Methods for the Examination of Water and Waste</u>, 17 ed, (1989)/18ed (1992).
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

L-WI-034/D-6/99

#### Recra LabNet - Lionville

#### INORGANICS DATA SUMMARY REPORT 09/28/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

WORK ORDER: 10985-001-001-9999-00

					REPORTING	DILUTION
SAMPLE	SITE ID	analyte	RESULT	UNITS	LIMIT	FACTOR
******	********	****		*****	********	
-002	BOW9P1	Chloride by IC	0.25 u	MG/L	0.25	1.0
	~	Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH ·	5.8	PH UNITS	0.01	1.0
		Sulfide	1.0 11	MG /T.	1 0	

#### Recra LabNet - Lionville

#### INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/28/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

WORK ORDER: 10985-001-001-9999-00

		•			reporting	DILUTION
SAMP	LB SITE ID	ANALYTE	result	UNITS	LIMIT	FACTOR
****		**************			*******	****
BLAN	K10 99LICA77-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLAN	K10 99LICB77-MB1	Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLAN	K10 99LN3046-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLAN	K10 99LAMA35-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLAN	K10 99LSD044-MB1	Sulfide	1.0 u	MG/L	1.0	1.0

#### INORGANICS ACCURACY REPORT 09/28/99

CLIENT: TNU-HANFORD B99-085

WORK ORDER: 10985-001-001-9999-00

. RECRA LOT #: 9909L006

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE.ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RBCOV	Factor (SPK)
	***************************************	******					
-002	BOW9P1	Chloride by IC	5.2	0.00	5.0	104.5	1.0
		Fluoride by IC	10.9	0.00	10.0	108.8	1.0
		Nitrite by IC	5.2	0.25 դ	5.0	104.4	1.0
		Nitrate by IC	5.2	0.25u	5.0	103.1	1.0
		Phosphate by IC	5.2	0.25u	5.0	104.1	1.0
	•	Sulfate by IC	5.1	0.25u	5.0	102.0	1.0
	-	Sulfide	10.0	0.80	10.0	92.0	1.0
		sulfide MSD	10.1	0.80	10.0	92.4	1.0
BLANK1	0 99LICA77-MB1	Chloride by IC	4.8	0.25u	5.0	96.3	1.0
		Fluoride by IC	10.3	0.50u	10.0	102.8	1.0
	_	Nitrite by IC	5.0	0.25u	5.0	99.9	1.0
		Nitrate by IC	4.9	0.25u	5.0	97.8	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.2	1.0
BLANK1	0 99LICB77-MB1	Phosphate by IC	4.9	0.25u	5.0	98.8	1.0
BLANK1	0 99LN3046-MB1	Nitrate Nitrite -	0.51	0.02u	0.50	102.8	1.0
		Nitrate Nitrite MSD	0.51	0.02u	0.50	102.4	1.0
BLANK1	0 99LAMA35-MB1	Ammonia, as N	1.0	0.10u	1.0	103.0	1.0
		Ammonia, as N MSD	1.0	0.104	1.0	101.0	1.0
BLANK1	0 99LSD044-MB1	Sulfide	10.0	1.0 u	10.0	100	1.0
		Sulfide MSD	10.0	1.0 u	10.0	100	1.0

#### INORGANICS DUPLICATE SPIKE REPORT 09/28/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

		21172#1	SPINE#2	•
SITE ID	ANALYTE	*RECOV	*RBCOV	*DIPP
		*****		
BOW9P1	Sulfide	92.0	92.4	0.43
99LN3046-MB1	Nitrate Nitrite	102.8	102.4	0.39
99LAMA35~MB1	Ammonia, as N	103.0	101.0	2.0
99LSD044-MB1	Sulfide	100	100	0.00
	BOW9P1 99LN30%6-MB1 99LAMA35-MB1	BOW9P1 Sulfide 99LN3046-MB1 Nitrate Nitrite 99LAMA35-MB1 Ammonia, as N	SITE ID ANALYTE *RECOV  BOW9P1 Sulfide 92.0  99LN3046-MB1 Nitrate Nitrite 102.8  99LAMA35-MB1 Ammonia, as N 103.0	BOW9P1 Sulfide 92.0 92.4 99LN3046-MB1 Nitrate Nitrite 102.8 102.4 99LAMA35-MB1 Ammonia, as N 103.0 101.0

#### INORGANICS PRECISION REPORT 09/28/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTB	RESULT	REPLICATE	RPD	factor (rep)
======	*************	***************	*******	*******		
-002REP	BOW9P1	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.25u	0.25u	NC	1.0
		Sulfide	1 0 11	1 0 11	NC	1.0

## Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR 19PR3:

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOW9P1						
CHLORIDE BY IC	002	W	99LICA77	09/01/99	09/16/99	09/16/99
CHLORIDE BY IC	002 REP	W	99LICA77	09/01/99	09/16/99	09/16/99
CHLORIDE BY IC	002 MS	W	99LICA77	09/01/99	09/16/99	09/16/99
FLUORIDE BY IC	002	W	99LICA77	09/01/99	09/16/99	09/16/99
FLUORIDE BY IC	002 REP	W	99LICA77	09/01/99	09/16/99	09/16/99
FLUORIDE BY IC	002 MS .	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRITE BY IC	002	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRITE BY IC	002 REP	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRITE BY IC	002 MS	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRATE BY IC	002	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRATE BY IC	002 REP	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRATE BY IC	002 MS	W	99LICA77	09/01/99	09/16/99	09/16/99
PHOSPHATE BY IC	002	W	99LICB77	· · · · · · · · · · · · · · · · · · ·	09/16/99	09/16/99
PHOSPHATE BY IC	002 REP	W	99LICB77	09/01/99	09/16/99	09/16/99
PHOSPHATE BY IC	002 MS	W	99LICB77	09/01/99	09/16/99	09/16/99
SULFATE BY IC	002	W	99LICA77	09/01/99	09/16/99	09/16/99
SULFATE BY IC	002 REP	W	99LICA77	09/01/99	09/16/99	09/16/99
SULFATE BY IC	002 MS	W	99LICA77	09/01/99	09/16/99	09/16/99
NITRATE NITRITE	002	W	99LN3046	09/01/99	09/22/99	09/22/99
AMMONIA	002	W	99LAMA35	09/01/99	09/15/99	09/15/99
PH	002	W	99LPH102		09/23/99	09/23/99
SULFIDE	002	W	99LSD044		09/07/99	09/07/99
SULFIDE	002 REP	W	99LSD044	*. *.	09/07/99	09/07/99
SULFIDE	002 MS	W	99LSD044		09/07/99	09/07/99
SULFIDE	002 MSD	W	99LSD044		09/07/99	09/07/99
LAB QC:						
				(-		
CHLORIDE BY IC	MB1	W	99LICA77		09/16/99	09/16/99
CHLORIDE BY IC	MB1 BS	W	99LICA77		09/16/99	09/16/99
FLUORIDE BY IC	MB1	W	99LICA77		09/16/99	09/16/99
FLUORIDE BY IC	MB1 BS	W	99LICA77	•	09/16/99	09/16/99
NITRITE BY IC	MB1	W	99LICA77	•	09/16/99	09/16/99
NITRITE BY IC	MB1 BS	W	99LICA77	•	09/16/99	09/16/99
NITRATE BY IC	MB1	W	99LICA77	N/A	09/16/99	09/16/99

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR 19PR3:

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	· ANALYSIS
NITRATE BY IC	MB1 BS	W	99LICA77	N/A	09/16/99	09/16/99
PHOSPHATE BY IC	MB1	W	99LICB77	N/A	09/16/99	09/16/99
PHOSPHATE BY IC	MB1 BS	W	99LICB77	N/A	09/16/99	09/16/99
SULFATE BY IC	MB1	W	99LICA77	N/A	09/16/99	09/16/99
SULFATE BY IC	MB1 BS	W	99LICA77	N/A	09/16/99	09/16/99
NITRATE NITRITE	MB1	W	99LN3046	N/A	09/22/99	09/22/99
NITRATE NITRITE	MB1 BS	W	99LN3046	N/A	09/22/99	09/22/99
NITRATE NITRITE	MB1 BSI	W C	99LN3046	N/A	09/22/99	09/22/99
AMMONIA	MB1	` W	99LAMA35	N/A	09/15/99	09/15/99
AMMONIA	MB1 BS	. W	99LAMA35	N/A	09/15/99	09/15/99
AMMONIA	MB1 BSI	W C	99LAMA35	N/A	09/15/99	09/15/99
SULFIDE	MB1	. W	99LSD044	N/A	09/07/99	09/07/99
SULFIDE	MB1 BS	W	99LSD044	N/A	09/07/99	09/07/99
SULFIDE	MB1 BSI	W C	99LSD044	N/A	09/07/99	09/07/99

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RECRA	Laving	USU	CITIES

### Custody Transfer Record/Lab Work Request Page \_\_\_\_\_\_\_ of \_\_\_\_\_

99091	L006

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS



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Client 7/	1U.	- HANFORD B99	1-085	Refrige	rator#			6					6		4	6	6			0
Est. Final Pro	j. Samj	oling Date		#/Tune	Container	Liquid	30	2A6	+		•		ifc	<u> </u>	IPC	19	16	ļ		<u> </u>
Project # 10	1985	-001-001-9999-00				Solid	<u> </u>	·					<u> </u>		ļ		<u> </u>			<u> </u>
Project Conte	act/Pho	ne#		Volume	9	Liquid	40	950					190		500	16	1L			<u> </u>
RECRA Proje	ct Man	ager OT				Solid	ļ						ļ.,.,	-	ممر ا		<u> </u>	ļ	ļ	<u> </u>
ac spec	<u></u>	Del 570 TAT 30	Day	Preser	vatives		HCL			L	_		MO.	2	VAOH	-	H2504	<u> </u>		<u> </u>
Date Rec'd	9- :	3 - 99 Date Due 10-3	·25g	ANALY	'SES		<del>-</del>		ANIC					ORG_	1					
Account #		bate bue _k		REQUE	STED		o o o	BNA	Pest/ PCB	Herb			Metal	S						
MATRIX			Matrix							1		RECRA	LabNe	t Use	Only		1	·····		
CODES:	Lab		QC Chosen		Date	Time	Συ	24					9		b	100	18 %			
S - Soil SE - Sediment	ID	Client ID/Description	(V)	Matrix	Collected		20	3					METO		SF	2	25	1		
SO - Solid SL - Sludge			MS MSD	<u> </u>			262	0					X		,	22.50	54X			
W Water O - Oil	001	BOW9PO		W	9-1-99	0500	3													
A - Air DS - Drum	000	4 1		1	+	0634	3	2					1		1	1	1			
Solids																				
DL - Drum Liquids		•					1	1												
L - EP/TCLP Leachate							1													
WI - Wipe X - Other								-					1				$\Box$			
F - Fish	<u> </u>			,	1 :		1-			<del>                                     </del>			1		1		1			
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Sanalal trademat	<u>                                     </u>	<u> </u>	DATE	/REVISIO	1 1H, 1C+ 2=1-P) 3 AS, B 4 1PH, 1		<u>.l.</u>	<u> </u>	<u></u>	. الــــــا			<del>'</del>	<u> </u>	REC	RA La	bNet U	se Only		
Special Instruct	nons:	100-585		>	1 1H, 1C1	<u> 102,10</u>	<b>XO3</b>	, ICf	<u> </u>	tak	en	to la	<u>/</u> 0_s	amples	were:	/		C Tape		
say	7. FF	B99-085	Ø	(SC_	2=1-12	ropa	rol.	=3	tha	not_		a 110 9.3	<u>^\                                    </u>	Shippe	ad 🚣	ОГ	1)	Present	Out	ter
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,		WASTE	<u> </u>	hu-	4. LL.FL <sub>q.</sub> .1.	Cock II	<u> </u>	<u>, LU</u>	, , <del>,</del>	IVNI	-1	14197	r 3	Receiv	ed in G	lood	3) 1	Present	on San	
					5. <u>/CS04</u>	Ł							-   '	ondition	_			Unbroke		
					6			,					<sup>4)</sup> P	Labels roperly	Preserv	ed		mple Y		
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by						CALU	723	<del>                                     </del>	$\dashv$	COC	Record	els and ? Y or (N)	5) H	receiv olding T	rea Will Times	Mary a	-21 47 Co	oler	or (v)	N
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	l		II nc	. VV			٠٠ (					PH,1	VU2	100	3 1 10	41	<u>icil</u>	Bus	<u> 1./4</u>	eCd

Bechtel Hanford Inc.	COU	CI	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  B99-085-03										Page <u>1</u> of <u>1</u>	
Collector Doug Bowers/Brent Porter		Compo Chri	any Contact is Cearlock	Telephor 372-95	ne No. 574			Project Coor TRENT, SJ	linator	Price Code	7N		rnaround	
Project Designation 200 Area Source characterization - 200	CW-1 OIL-OC	Sampl	ing Location East 200 CW1 GP#	12 0. 1	an m			SAF No. B99-085			45	Days \		
Ice Chest No. PLCOW-03		Field I	Logbook No.	14/	17 13	<u></u>		Method of Sh Federal Ex						
Shipped To TMA/RECRA  TALL 7-1-99		Offsite	Property No.	99024	3			Bill of Ladin	/Air Bill N 4a	10. -3570	629	057		
:								COA	320	cu,	6716	<b>,</b>	<b>*</b>	
POSSIBLE SAMPLE HAZARDS/RE	MARKS		Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4	C HNO3 to pl	HCI to pH Cool 4C	<2	<u>.</u>			
			Type of Container	P	P	P	aG	G/P	aGs*	P				
Special Handling and/or Storage			No. of Container(s)  Volume	1 500mL	1 1000mL	1 1000mL	2 1000m	2 .L 1000mL	3 40mL	3 500mL				
SA	MPLE ANALYS	is .	Volume	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VO 8270A (T			A - Special dd- Instructions.	7			
, Sample No. M	atrix *	Sample Date	Sample Time	1 10 10	22.65									
BOW9PO V	Vater 9	-1-99	0500						X			ļ		
B0W9P1 V	Vater 9	1-1-99	0630	<u>X</u>	X	X	X		X	+X				
									_		<u> </u>			
					SPEC	TAL INSTR	UCTIO	NS				Matrix		
Relinduished By Da  FeO CX 93.99	terTime (330)	Received By Received By Received By	1A 9.1-9 Nicko-fr.Ne Fed Ex	ate/Time  2//200  ate/Time  ate/Time  Time	See C (1) It (Wate (2) It Selen Vana	Chain of Custod C Anions - 300 er) - 9040 CP Metals - 60 ium, Silver}; It dium, Zinc}	dy commercial (Chlorical CP) (Chlorical CP) (CP) (CP) (CP) (CP) (CP) (CP) (CP)	nts on SAF for s de, Fluoride, Nic entrace) (Arsenic - 6010A (Super	rate, Nitrite, I , Barium, Cac trace Add-On	tions.  Phosphate, Sulfa dmium, Chromiu  ) {Copper, Nicko  ASCL  AND  AND  AND  AND  AND  AND  AND  AN	m, Lead, el, LQS.	Soil Water , Vapor Other Solid Other Liquic		
LABORATORY Received By SECTION FINAL SAMPLE Disposal Method						Dispo	sed By		··-			Date/Time	· · · · · ·	

#### Virtual Laboratories Everywhere

#### Recra LabNet Philadelphia **Analytical Report**

Client: TNU-HANFORD B99-085

RFW#: 9909L006

**SDG/SAF#**: B99-085/H0515

W.O.#: 10985-001-001-9999-00

Date Received: 09-03-99

#### METALS CASE NARRATIVE

- 1. This narrative covers the analyses of 1 water sample.
- 2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. The cooler temperature has been recorded on the Chain of Custody.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value). Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 43

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

mld/m09-006

#### METALS METHOD GLOSSARY

Recra Lot#: 9909L006											
Leaching Procedure:131013111312Other:											
CLP Metals D	igestion andAnalysis M	Iethods:ILM03.0	_ILM04.0								
Metals Digestion	Methods:3005A30 Other:	10A30153020A	A3050A _	3051200.7	7SS17						
		etals Analysis Meth	ode								
	141	etais Analysis Meta	ous	EPA							
	SW846	EPA	STD MTD	OSWR	USATHAMA						
Aluminum	6910 <b>B</b>	200.7	~~~	<b>4.2</b>	99						
Antimony	6010B 7041 5	200.7 204.2			<sub>99</sub>						
Arsenic	6010B 7060A 5	200.7 206.2	3113B								
Barium	6010B	200.7									
Beryllium	<b>76010B</b>	200.7									
Bismuth	6010B <sup>1</sup>	200.7 1		1620	99						
Boron	6010 <b>B</b>	200.7			99						
Cadmium	6010B _7131A 5	200.7 213.2			<u>_</u> 99						
Calcium	6010B	200.7	•		<b>99</b>						
Chromium	<b>Z</b> 6010B _7191 ⁵	200.7218.2			SS17						
Cobalt	6010 <b>B</b>	200.7			99						
Copper	<b>Z</b> 6010B7211 ⁵	200.7220.2			<del>99</del>						
Iron	6010B	200.7			<del>99</del>						
Lead	<b>√</b> 6010B7421 <sup>5</sup>	200.7239.2	3113B		99						
Lithium	6010B7430 <sup>4</sup>	200.7		1620	99						
Magnesium	6010B	200.7			99						
Manganese	6010B	200.7			99						
Mercury	$_{_{}}$ 7470A $^{3}$ $_{_{}}$ 7471A $^{3}$	$245.1^{2}245.5^{2}$			_99						
Molybdenum	6010 <b>B</b>	200.7			99						
Nickel	<b>√</b> 6010 <b>B</b>	200.7			99						
Potassium	_6010B7610 <sup>4</sup>	200.7258.1 4			99						
Rare Earths	_6910B ¹	200.7 1		1620	99						
Selenium	<u>√6010B</u> 7740 <sup>5</sup>	200.7270.2	3113B	* <00	99						
Silicon	6010B ¹	200.7		1620	99						
Silica	6010B	_200.7		1620	99						
Silver	∠6010B _7761 <sup>5</sup>	200.7272.2			<del>99</del>						
Sodium	6010B7770 4	200.7273.1 <sup>4</sup>			99						
Strontium Thallium	6010 <b>B</b> 6010 <b>B</b> 7841 <sup>5</sup>	<del></del>	0								
Thamum Tin	6010 <b>B</b> 7841 <sup>5</sup> 6010 <b>B</b>	200.7279.220 200.7	10.9		99						
Titanium	6010 <b>B</b>	200.7			—99 99						
Uranium	6010B <sup>1</sup>	200.7		1620							
Vanadium	6010B	200.7		1020	<del>99</del>						
Zinc -	<b>√</b> 6010 <b>B</b>	200.7			— <del>99</del>						
Zirconium	6010B <sup>1</sup>	200.7 200.7 ¹		1620	<sup>23</sup> 99						
ZA COMUIII	0010 <b>D</b>	200.7		1020							
Other:	Method	od:			003						

Other:\_ L-WI-033/M-03/98

#### METHOD REFERENCES AND DATA QUALIFIERS

#### **DATA QUALIFIERS**

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

#### **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

#### ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA.
- 5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

#### INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
		<b>医巴里里巴里芹菜林米加茶片水干茶杯茶菜店店装置</b>				******
-002	BOW9P1	Silver, Total	1.0 u	UG/L	1.0	1.0
		Arsenic, Total	3.3 u	UG/L	3.3	1.0
	•	Barium, Total	0.60	DG/L	0.30	1.0
		Beryllium, Total	0.12	UG/L	0.10	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
	•	Chromium, Total	0.80 u	UG/L	0.80	1.0
		Copper, Total	1.2 u	UG/L	1.2	1.0
		Nickel, Total	1.2 u	UG/L	1.2	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Antimony, Total	2.5 u	UG/L	2.5	1.0
		Selenium, Total	3.7 u	DG/L	3.7	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	0.80 u	UG/L	0.80	1.0

#### INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/01/99

CLIENT: THU-HANFORD B99-085

RECRA LOT #: 9909L006

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	resul <b>t</b>	UNITS	LIMIT	FACTOR
*****	**************		======	****	*******	
BLANK1	99L0645-MB1	Silver, Total	1.0 u	ng/L	1.0	1.0
		Arsenic, Total	3.3 u	UG/L	3.3	1.0
		Barium, Total	0.38	UG/L	0.30	1.0
		Beryllium, Total	0.10 u	DG/L	0.10	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Chromium, Total	0.80 u	UG/L	0.80	1.0
		Copper, Total	1.2 u	UG/L	1.2	1.0
		Nickel, Total	1.2 u	UG/L	1.2	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Antimony, Total	2.5 u	UG/L	2.5	1.0
		Selenium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zina Total		TG /T	0.00	

#### INORGANICS ACCURACY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RECOV	factor (SPK)
		*************	******		*****		********
-002	BOW9P1	Silver, Total	49.9	1.0 u	50.0	99.8	1.0
		Arsenic, Total	2000	3.3 u	2000	100.2	1.0
		Barium, Total	1930	0.60	2000	96.3	1.0
		Beryllium, Total	49.8	0.12	50.0	99.4	1.0
		Cadmium, Total	49.7	0.30u	50.0	99.4	1.0
		Chromium, Total	199	0.80u	200	99.6	1.0
		Copper, Total	240	1.2 u	250	96.2	1.0
		Nickel, Total	500	1.2 u	500	100	1.0
		Lead, Total	498	2.1 u	500	99.6	1.0
		Antimony, Total	500	2.5 u	500	100	1.0
		Selenium, Total	2010	3.7 u	2000	100.4	1.0
		Vanadium, Total	493	0.60u	500	98.5	1.0
		Zinc. Total	489	0.80u	500	97.8	1.0

#### INORGANICS PRECISION REPORT 10/01/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

WORK ORDER: 10985-001-001-9999-00

			INITIAL			DILUTION
SAMPL	E SITE ID	ANALYTE	result	REPLICATE	RPD	FACTOR (REP)
	***************************************	***************************************	******		*****	**********
-002R	REP BOW9P1	Silver, Total	1.0 u	1.0 u	NC	1.0
		Arsenic, Total	3.3 u	3.3 u	NC	1.0
		Barium, Total	0.60	0.61	1.7	1.0
		Beryllium, Total	0.12	0.12	0.00	1.0
		Cadmium, Total	0.30u	0.30u	NC	1.0
		Chromium, Total	0.80u	0.80u	NC	1.0
		Copper, Total	1.2 u	1.2 u	NC	1.0
	•	Nickel, Total	1.2 u	1.2 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Antimony, Total	2.5 u	2.5 u	NC	1.0
		Selenium, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zing Total	0.800	1 4	W ADD	1.0

Correction idilya

#### INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/01/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9909L006

			SPIKED	SPIKED		
SAMPLE	SITE ID	analyte	SAMPLE	AMOUNT	UNITS	%RECOV
	*************	*****************	*****	******	*****	=====
LCS1	99L0645-LC1	Silver, LCS	490	500	UG/L	98.0
		Arsenic, LCS	9940	10000	UG/L	99.4
		Barium, LCS	4880	5000	OG/L	97.6
		Beryllium, LCS	248	250	OG/L	99.4
		Cadmium, LCS	250	250	UG/L	100
		Chromium, LCS	497	500	UG/L	99.4
		Copper, LCS	1210	1250	UG/L	96.4
		Nickel, LCS	2010	2000	UG/L	100.4
		Lead, LCS	2490	2500	UG/L	99.6
		Antimony, LCS	2990	3000	UG/L	99.5
		Selenium, LCS	10000	10000	UG/L	100.2
		Vanadium, LCS	2480	2500	DG/T	99.1
		Zinc. LCS	981	1000	UG/L	98.1

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-085

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

·						
CLIENT ID /ANALYSIS	RFW #	хтм	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						<del></del>
B0W9P1						
SILVER, TOTAL	002	M	99L0645	09/01/99	09/22/99	09/23/99
SILVER, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99
SILVER, TOTAL	002 MS	W	99L0645	09/01/99	09/22/99	09/23/99
ARSENIC, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
ARSENIC, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99
ARSENIC, TOTAL	002 MS	W	99L0645	09/01/99	09/22/99	09/23/99
BARIUM, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
BARIUM, TOTAL	002 REP	W	9910645	09/01/99	09/22/99	09/23/99
BARIUM, TOTAL	002 MS	W	9910645	09/01/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	002	W	9910645	09/01/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	002 REP	W	9910645	09/01/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	002 MS	W	9910645	09/01/99	09/22/99	09/23/99
CADMIUM, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
CADMIUM, TOTAL	002 REP	W	9910645	09/01/99	09/22/99	09/23/99
CADMIUM, TOTAL	002 MS	W	99L0645	09/01/99	09/22/99	09/23/99
CHROMIUM, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
CHROMIUM, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99
CHROMIUM, TOTAL	002 MS	W	99L0645	09/01/99	09/22/99	09/23/99
COPPER, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
COPPER, TOTAL	002 REP	W	9910645	09/01/99	09/22/99	09/23/99
COPPER, TOTAL	002 MS	W	9910645	09/01/99	09/22/99	09/23/99
NICKEL, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
NICKEL, TOTAL	002 REP	W	9910645	09/01/99	09/22/99	09/23/99
NICKEL, TOTAL	002 MS	W	9910645	09/01/99	09/22/99	09/23/99
LEAD, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
LEAD, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99
LEAD, TOTAL	002 MS	W	99L06 <b>45</b>	09/01/99	09/22/99	09/23/99
ANTIMONY, TOTAL	002	W	99L0645	09/01/99	09/22/99	09/23/99
ANTIMONY, TOTAL	002 REP	M	99L0645	09/01/99	09/22/99	09/23/99
ANTIMONY, TOTAL	002 MS	M	9910645	09/01/99	09/22/99	09/23/99
SELENIUM, TOTAL	002	M	9910645	09/01/99	09/22/99	09/23/99
SELENIUM, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99
SELENIUM, TOTAL	002 MS	W	99L0645	09/01/99	09/22/99	09/23/99
VANADIUM, TOTAL	002	W	9910645	09/01/99	09/22/99	09/23/99
VANADIUM, TOTAL	002 REP	W	99L0645	09/01/99	09/22/99	09/23/99

RECRA LabNet Use Only
99091006

# Custody Transfer Record/Lab Work Request Page 1 of 1



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			10 11 902					Liquid	306		(0)\n'i		3 8 4	1		PC	1.0	PL	PA	10		建學	. D. 19.
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		'			ا <del>کیات ۔</del> دوران		···	Liquid	40	950		77.75	100	33.00	(2)	1D	机模	ÇΦ	الدارا	ILA	49.99	Septiment of the	8
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MATRIX CODES:					atrix 2C osen		Date	Time	Fo	T				-		0		2	07	122, 132,			
S - Soil SE - Sediment	Lab ID	Client ID/Desc	ription		<b>√</b> )	Matrix		Collected	20	איז ע	] ,					MET		SF	3	131	}	j 	
SC - Solid SL - Sludge				MS	MSD				36	8						W		\$	Ŋ	<u> </u>	18-35-6	1956 1 15	
W - Water O - Oil	001	BOW9PO			i di	W	7-199	0500	3		12 M		数 <b>4</b> (4) (3) 8(4) (4)	14.4	istorijas Graforijas	. w e 3	(149)d)	W.		Ken (A)	ea amin	Tree Sec.	-44
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Special Instruc	llone:	<u> </u>			DATE	/REVISIO	NSD.	1.00		1		La	F.	L	10	$\iota \Box$		REC	RA Lai	Net U	se Only		
O A	o st	B99-085			<u></u>	<u>≫</u>	1 1H, 1C	NO2,19	<u>2003.</u>	101	204 24	100	<u> en</u>	- 10	u		mples	were:	/		OC Tap Presen		itor
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Relinquished by	Received by	Date	Time
FedCV	Thuray	9-599	0930
	1		

WASTE

Discrepancies Between Samples Labels and COC Record? Y or (N) NOTES:

4) Labels Indicate Properly Preserved or N

3) Received in Good Condition or N

5) Received Within **Holding Times** 

3) Present on Sample

4) Unbroken on Sample Y or N **COC Record Present** 

Cooler -

Bechtel Hanford Inc.	(600)	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									9-085-03	Page 1	of <u>1</u>
Collector Doug Bowers/Brent Porter Project Designation		Chi	pany Contact ris Cearlock ling Location	Telephor 372-95	574	10		Project Coordi TRENT, SJ SAF No. B99-085	nator	Price Code	7N	<del></del>	rnaround Days
200 Area Source characterization - 20 Ice Chest No. ELCOG-O3		Field EL	East 200 CWI GP # . Logbook No. -1511	12 901	·79 %	<u> </u>		Method of Ship Federal Expr	ess			•	
Shipped To TMA/RECRA by 7-1-99		Offsit	e Property No.	99024	3		:	Bill of Lading/	Air Bill No 42	3579	529	057	
			· · · · · · · · · · · · · · · · · · ·	<b></b>	i			COA	200	cu,	6716		· 
POSSIBLE SAMPLE HAZARDS/RE	EMARKS		Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 40	<2	HCl to pH <	<2			<u>.</u>
			Type of Container	P	P	P	aG 2	G/P	aGs*	P 3			
Special Handling and/or Storage			No. of Container(s)  Volume	500mL	1000mL	1000mL	1000m	ľ	40mL	500mL			
SA	AMPLE ANALYSIS	<u> </u>	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VO 8270A (T		VOA - 8260. (TCL); VOA 8260A (Add On) {1- Propanol, Ethanol}	Special				
Sample No. N	1atrix Sa	nple Date	Sample Time	i de									
B0W9P0 · \	Water 90	-99	0500						X				
B0W9P1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Water 9 -	1-99	0630	X	X	X	X		X	X		· · · · · · · · · · · · · · · · · · ·	
A many Agreemen 90%	1.99/1200	ived Du	1 A 9.1.9	ate/Time  9//200  ate/Time, 12/  Sup   2/0	See C (1) 10 (Wate (2) 10 Seleni	C Anions - 300 r) - 9040 CP Metals - 60	ty commen .0 {Chloric 10A (Supe CP Metals	ts on SAF for spec de, Fluoride, Nitra rtrace) {Arsenic, I - 6010A (Supertra	te, Nitrite, Pl Barium, Cadr Ice Add-On)	nosphate, Sulfate nium, Chromiun {Copper, Nickel	ı, Lead,	Matrix Soil Water Vapor Other Solid Other Liquid	
Relinquished By Day Relinquished By Day	ate/Time (331) Reco	ived By	Eder D	nte/Time	F	to fe		chaist		able ampl	·	ate/Time	
FINAL SAMPLE Disposal Method DISPOSITION						Dispo	sed By				D:	ate/Time	



Chemical and Environmental Measurement Information

#### Recra LabNet Philadelphia Analytical Report

Client: TNU HANFORD B99-085

**RFW** #: 9909L006

SDG/SAF#: H0515/B99-085

W.O. #: #

**W.O.** #: #: 10985-001-001-999

Date Received: 09-03-99

GC SCAN

The set of samples consisted of two (2) water samples collected on 09-01-99.

The samples and their associated QC samples were prepared on 09-13-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-13-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The samples were packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- 4. Continuing calibration criteria (±15%) were exceeded for the continuing calibration verification standard analyzed prior to the sample extracts. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.
- 5. Surrogates were not used for this analysis.
- 6. The blank spike recovery was within advisory control limits of 50%-150%.
- 7. All matrix spike recoveries were within advisory control limits of 50%-150%.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

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9\_27\_99

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

#### **GLOSSARY OF OGCSC DATA**

#### **DATA QUALIFIERS**

- U = Indicates that the compound was analyzed for but not detected.

  The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

#### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates spiked compound.

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #:
Initiator: (Schnell RFW Batch: 40080 400803) Parameter: 0600
Date: 9/16/9 Samples: 9/09/006 Matrix:
Client: TNU Hartord Method: SW846/MCAWWICLPI Prep Batch: Wuffple
1. Reason for SDR a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
Transcription Error Wrong Test Code Other b. General Discrepancy
Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold Improper Bottle Type Not Amenable to Analysis
Note : Verified by [Log-In] or [Prep Group] (circle)signature/date:
c. QC Problem (Include all relevant specific results; attach data if necessary)
CCV response somewhat erratic during sample analysis, most hang high. In cases
CCV response somewhat erratic during sample analysis, most being high. In cases whereby instrument response decreased the decrease did not exceed - 20% Deviation.
2. Known or Probable Causes(s) - Heavy analysis load combined with agreeous matrix contributes to reduced stability of
- Heavy analysis load combined with aqueous matrix contributes to reduced stability of instrument response compared to solvent type matrices.
3. Discussion and Proposed Action Other Description:
Re-log Entire Batch - No positives found in any emplos.
Following Samples:
Re-leach - the laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from the laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from common - The laboratory limit of 15 acrived from the laboratory limit of 15 ac
Following Samples:  — Re-leach — Re-extract — Re-digest — Revise EDD  — Re-digest — Revise EDD  — The laboratory limit of £15% Deviation is derived from common analysos, and may not be applicable to extended runs of aqueous camples, where such criteria may not be readily achievable.
Change Test Code to / //
Place On/Take Off Hold (circle)  4. Project Manager Instructionssignature/date: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Concur with Proposed Action
Disagree with Proposed Action; See Instruction Include in Case Narrative
Client Contacted: Date/Person
Add
Cancel
5. Final Actionsignature/date: // / / / // Other Explanation:  Verified re-[log][leach][extract][digest][analysis] (circle)
☐ Included in Case Narrative ☐ Hard Copy COC Revised
Electronic COC Revised
EDD Corrections Completed When Final Action has been recorded, forward original to QA Specialist for distribution and filing.
Route Distribution of Completed SDR  X Initiator X Lab Manager: M. Taylor X Project Mgr: Stone/Carey/Schrenket/Johnson X Section Mgr: Wesson/Daniels X QA (file): Racioppi Data Management: Feldman  Route Distribution of Completed SDR Metals: Doughty Inorganic; Perrone GC/LC: Schnell MS: LeMin/Taylor Log-in: Toder Admin: Soos
T X Project Mgr. Stone/Carey/Schrenket/Johnson GC/LC: Schnell
X Section Mgr: Wesson/Daniels MS: LeMin/Taylor Log-in: Toder
Data Management: Feldman Admin: Soos Sample Prep: Schnell/Doughty/Kauffman Other:

#### Recra LabNet - Lionville Laboratory

GC SCAN

Work Order: 10985-001-001-9999-00 RFW Batch Number: 9909L006 Client: TNU-HANFORD B99-085 Page: 004 BLK BS Cust ID: BOW9P0 BOW9P0 BOW9P0 BOW9P1 BLK 99LLC140-MB1 99LLC140-MB1 Sample RFW#: 001 001 MS 001 MSD 002 Information WATER WATER WATER WATER WATER WATER Matrix: 1.00 1.00 1.00 D.F.: 1.00 1.00 1.00 mg/L mg/L mg/L mg/L mg/L mg/L Units: 5.0 U 5.0 U n-Propyl Alcohol 5.0 U 105 100 92 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U Ethanol 5.0 U

Oblight

Report Date: 09/16/99 09:11

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of Advisory limits.

# Recra LabNet - Lionville Laboratory GCSC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-085

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
•		<del></del>	<del></del>			· · · · · · · · · · · · · · · · · · ·
BOW9PO	001	W	99LLC140	09/01/99	09/13/99	09/13/99
BOW9PO	001 MS	W	99LLC140	09/01/99	09/13/99	09/13/99
BOW9PO	001 MSD	W	99LLC140	09/01/99	09/13/99	09/13/99
B0W9P1	002	W	99LLC140	09/01/99	09/13/99	09/13/99
LAB QC:						
BLK	MB1	W	99LLC140	N/A	09/13/99	09/13/99
BLK	MB1 BS	W	99LLC140	N/A	09/13/99	09/13/99



RECRA Lab		l	Custo	dy T	rans	sfe	er F	Rec	ord/l	_ab	Wo	rk	Re	eqi	ies mu	t Pa	age ₋ ∂	0	t <u> </u>	-	6		F	RECR	
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SE - Sediment SO - Solid	l 1D			•			<b>^</b> )		Collected	Conected	262	18						We.		SF	377	11/3			
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Leachate WI - Wipe																				<u> </u>					
X - Other F - Fish									ļ									<u> </u>		-					
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Special instruct	ons.	B99-0	85					<b>&gt;</b>	1 PH, ICI 2=1-P 3 AS, B	NO2,10	<u> </u>	1cl	704	ta	Ren	10	lu	$p_{s}$	amples	were:	/		Tapa		
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COMPOSITE WASTE									4.18H, 1	cci, 19	CEZ,	IU	<u>202</u>	SCA	10.3	, ice	204,	,   2)		nt or et	_		resent	on Sample	
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Bechtel Hanford	inc.	(0)	CHAIN OF CUST	rody/s.	AMPLE	ANAL	r	В9	9-085-03	Page <u>l</u> of <u>l</u>							
Collector Doug Bowers/Brent Porter		Com	pany Contact hris Cearlock	Telephor				Project Coordi TRENT, SJ	nator	Price Code	7N	Data Tur	rnaround				
Project Designation 200 Area Source characterizat	ion - 200-CW-1 OU	Sam	pling Location 00 East 200 CW1 GP-#	12 901	.9a 18	JR.		SAF No. B99-085				45	Days				
Ice Chest No.		Field	i Logbook No. L-1511	107	77 10			Method of Shipment Federal Express									
Shipped To TMA/RECRA		Offs	ite Property No. A	99024	13			Bill of Lading/	057								
				•				COA	20	cwi	6716	· · · · · · · · · · · · · · · · · · ·	<del>,</del>				
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4	<2	HCl to pH Cool 40	₹ 4							
			Type of Container	P	P	P	aG	G/P	aGs*	P							
Special Handling and/or Stor	age		No. of Container(s)  Volume	1 500mL	1 1000mL	1 1000mL	1000n	2 nL 1000mL	3 40mŁ	3 500mL			<b> </b> 				
	SAMPLE ANA	ALYSIS		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-V0 8270A (1		VOA - 826 (TCL); VO 8260A (A On) (1- Propanol Ethanol	A - Special dd- Instructions.	n .						
Sample No.	Matrix *	Sample Dat	e Sample Time			0.101/2/23			W. S.	in Wileas			E 319				
B0W9P0	Water	9-1-99	0500	<u> </u>			<u> </u>		X				ļ				
B0W9P1	Water	9-1-99	0630	X	X	X	X		χ	X			ļ <u>.</u>				
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·					SPEC	IAL INSTR	UCTIO	NS SAF 6				Matrix	•				
Relinquished By 1043 Bow Relinquished By 1043 Bow Relinquished By Relinquished By Relinquished By	Date/Time UNUSA 424	Received By Received By Received By Received By	Nicko-fr.nie Fed EV	Pate/Fime 12 Date/Fime	(i) 1 (Wal (2) 1 (3) Seler Vana	C Anions - 300 er) - 9040 CP Metals - 60 nium, Silver); I dium, Zinc)	0.0 (Chlor 010A (Sup ICP Metal: LTW		Barium, Ca ace Add-Or	Phosphate, Sulfa	ım, Lead, el,	Soil Water Vapor Other Solid Other Liquid					
LABORATORY Received By SECTION	<u>599 093</u>	OITIL	umay 4.549	) <u> </u>	itle	rom n	<u>о                                    </u>	Red or	ra	<u></u>	l	Date/Time	<del></del>				
FINAL SAMPLE Disposal Me	ethod			Disposed By Date/Time													

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- 1



Chemical and Environmental Measurement Information

#### Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-085

W.O. #: 10985-001-001-9999-00

RFW#: 9909L006

Date Received: 09-03-99

SDG/SAF #: H0515/B99-085

#### **SEMIVOLATILE**

One (1) water sample was collected on 09-01-99.

The sample and its associated QC samples were extracted on 09-08-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 09-14-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
- 2. The required holding times for extraction and analysis were met.
- 3. Non-target compounds were detected in the samples.

4. These samples were spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the samples.

- 5. All surrogate recoveries were within EPA QC limits.
- 6. All matrix spike recoveries were within EPA QC limits.
- 7. All blank spike recoveries were within EPA QC limits.

8. The laboratory blank contained Diethylphthalate, Di-n-butylphthalate, bis(2EH)phthalate, bis(2EH)phthalate, di-n-octylphthalate, benzo(b)fluoranthene at levels less than the CRQL.

J. Michael Taylor

Da

Vice President

Philadelphia Analytical Laboratory

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

#### **GLOSSARY OF BNA DATA**

#### DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NO = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna



#### **GLOSSARY OF BNA DATA**

#### **ABBREVIATIONS**

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

**DL** = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

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#### Recra LabNet - Lionville Laboratory

Client: TNU-HANFORD B99-085

Semivolatiles by GC/MS, HSL List

Report Date: 10/05/99 17:57

Page: la

Work Order: 10985001001

RFW Batch Number: 9909L006 SBLKCO BS BOW9P1 BOW9P1 BOW9P1 SBLKCO Cust ID: 002 MSD 99LE1093-MB1 99LE1093-MB1 002 002 MS RFW#: Sample WATER WATER WATER WATER WATER Information Matrix: 1.00 D.F.: 1.00 1.00 1.00 1.00 UG/L UG/L UG/L Units: UG/L UG/L 75 왕 કૃ 80 % 왕 89 કૃ 77 Nitrobenzene-d5 72 73 왕 79 2-Fluorobiphenyl 75 왕 87 % 76 Surrogate 왕 102 106 95 Terphenyl-d14 97 કૃ 104 Recovery 69 ೪ 73 52 Phenol-d5 왕 83 왕 68 2 78 80 67 옷 88 81 2-Fluorophenol 84 92 90 89 왕 2,4,6-Tribromophenol 66 왕 % 10 U 68 0.6 J 73 66 Phenol Ū IJ 10 U 10 10 U 20 bis(2-Chloroethyl)ether 20 U 앟 10 U 75 2-Chlorophenol\_\_\_\_\_ 10 U 82 왕 74 IJ 20 U 10 U 10 10 U 20 U 1,3-Dichlorobenzene 10 U % 65 10 U 73 ş 54 1,4-Dichlorobenzene 20 U 10 U 10 U IJ 10 U 20 1,2-Dichlorobenzene 20 U 10 U 10 U 20 U 10 U 2-Methylphenol 10 U 2,2'-oxybis(1-Chloropropane)\_\_\_\_ 20 U 10 U U 10 U 20 10 U 20 U 10 U 20 U 4-Methylphenol 10 U જ 78 10 U N-Nitroso-di-n-propylamine 10 U 87 76 U 20 U 10 10 U . 20 Ū 10 U Hexachloroethane\_\_\_\_\_ Ū IJ 20 U 10 U 10 10 U 20 Nitrobenzene\_\_\_\_ 10 U 20 U 10 U 20 U 10 U Isophorone\_\_\_\_\_ 10 U 20 U 10 U U 2-Nitrophenol\_\_\_\_ 10 U 20 10 U 10 U 2,4-Dimethylphenol\_\_\_\_\_ 10 U 20 IJ 20 U 10 U 10 U bis(2-Chloroethoxy)methane\_\_\_\_ 10 U 20 U 20 U 20 U 10 U 10 U 2,4-Dichlorophenol\_\_\_\_\_ 10 U 20 U 10 U 68 왕 1,2,4-Trichlorobenzene\_\_\_\_ 10 U 73 ક્ષ 55 10 U 10 U 11 Naphthalene 10 U 20 U 20 10 U 10 U 10 U 20 U 20 U 4-Chloroaniline 10 U 10 U 20 U 17 Hexachlorobutadiene 10 U 10 U 76 ે % 76 4-Chloro-3-methylphenol 10 U 80 10 U 20 U 10 U 20 U 2-Methylnaphthalene\_\_\_\_\_ 10 U 10 U 10 U 20 U 20 U Hexachlorocyclopentadiene\_\_\_\_ 10 U 10 U 10 U 2,4,6-Trichlorophenol\_\_\_\_\_ 10 U 20 U 20 U 25 U 50 U 25 U 25 U 50 U 2,4,5-Trichlorophenol

\*= Outside of EPA CLP QC limits.

RFW Batch Number: 9909L006	Client:	TNU-	HANFORD B99-0	35	Wor	k Order: 109	85	<b>001</b> 001	Page: 1b		
Cust ID:	BOW9P1		B0W9P1	BOW9P		SBLKCO		SBLKCO BS			l:
RFW#:	002	!	002 MS	002 MSI	D	99LE1093-ME	31	99LE1093-M	<b>B1</b>		Ç
2-Chloronaphthalene	10	Ü	20 U	20	U	10	U		U		
2-Nitroaniline	25	U	50 U	50	U	25	U	25	U		
Dimethylphthalate		U	20 U	20	ΰ	10	U	10	U		
Acenaphthylene	10	U	20 U	20	U	10	U	10	U		
Acenaphthylene2,6-Dinitrotoluene	10	U	20 U	20	U	10	Ü	10	U		
3-Nitroaniline	25	U	50 U	50	U	25	U	25	U		
Acenaphthene		Ü	85 %	76	8	10	U	82	%		
2,4-Dinitrophenol	25	U	50 U	50	Ü	25	U	25	Ü		
4-Nitrophenol		U	55 %	46	%	25	U	61	%		
Dibenzofuran		U	20 U	20	U	10	Ū	10	Ų		
2,4-Dinitrotoluene	10	U	90 %	82	%	10	Ü	85	%		
Diethylphthalate	0.5	JВ	20 U	20	U	0.5	J	10	U		
4-Chlorophenyl-phenylether	10	U	20 U	20	Ù	10	U	10	U		
Fluorene		U	20 Ü	20	U	10	Ü	10	Ų		
4-Nitroaniline	25	U	50 U	50	Ū	25	U	25	U		
4,6-Dinitro-2-methylphenol	. 25	บ	50 U	50	U	25	U	25	Ų		
N-Nitrosodiphenylamine (1)		U	20 U	20	U	10	U	10	U		
4-Bromophenyl-phenylether		U	20 U	20	U	10	U	10	U		
Hexachlorobenzene		Ū	20 U	20	U	10	U	10	U		
Pentachlorophenol	25	U	74 %	82	8	25	U	87	왕		
Phenanthrene		U	20 U	20	U	10	U	10	U		
Anthracene		U	20 U	20	Ü	10	U	10	U		
Carbazole		ซ	· 20 U	20	U	<b>- •</b>	Ü	10	Ū		
Di-n-butylphthalate	0.7	JВ	, 1 JB	20	U	0.8	J	0.8	JΒ	j.	
Fluoranthene	_	υ	20 U	20	Ū	10	U	10	U		
Pyrene		U	101 %	96	ક	10	U	101	૪		
Butylbenzylphthalate	10	U	20 U	20	U	10	U	10	U		
3,3'-Dichlorobenzidine	10	U	20 U	20	U	10	U	10	U		
Benzo(a)anthracene		U	20 U	20	Ū	10	U	10	U		
Chrysene		U	20 U	20	U	10	U	10	U		
bis(2-Ethylhexyl)phthalate	. 2	JВ	14 JB	3	JB	4	J	5	JВ	<b>,</b>	
Di-n-octyl phthalate	10	υ	20 U	20	U	0.5	J	10	Ū		
Benzo(b) fluoranthene	10	U	20 U	20	Ü	0.6	J	10			
Benzo(k)fluoranthene	10	บ	20 U	20	Ū	10	U	10			
Benzo(a)pyrene	10	U	20 U	20	U	10	U	10	U		
Indeno(1,2,3-cd)pyrene	-	U	20 U	20	U	10	U	10	U		
Dibenz(a,h)anthracene	10	Ü	20 Ü	20	U	10	U	10	U		
Benzo(g,h,i)perylene	10	U	20 U	20	U	10	U	10	U		
(a) Grant be concreted from Dir	honrilamina	* *	- Outside of	מסא מד.ס המ	lim	ite		-			

(1) - Cannot be separated from Diphenylamine. \*= Outside of EPA CLP QC limits.

#### 1F

#### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.	
1				 -
i.	BOW9P1			

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER

Lab Sample ID: 9909L006-002

Sample wt/vol:  $\underline{1000}$  (g/mL)  $\underline{ML}$  Lab File ID:  $\underline{D091405}$ 

Level: (low/med) LOW

Date Received: 09/03/99

% Moisture: \_\_\_\_ decanted: (Y/N)\_\_

Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/14/99

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 2

CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================	=======================================	=======	=========	=====
1.	UNKNOWN	5.92	2	J
2.	UNKNOWN	21.80	2	J
			-	İ

#### Recra LabNet - Lionville Laboratory BNA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-085

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
		<del>-</del>		··		<del></del>
B0W9P1	002	W	99LE1093	09/01/99	09/08/99	09/14/99
BOW9P1	002 MS	W	99LE1093	09/01/99	09/08/99	09/14/99
BOW9P1	002 MSD	W	99LE1093	09/01/99	09/08/99	09/14/99
LAB QC:						
SBLKCO	MB1	W	99LE1093	N/A	09/08/99	09/14/99
SBLKCO	MB1 BS	W	99LE1093	N/A	09/08/99	09/14/99

RECRA Lab			Custo	Ody TI									Re	equ ③	ies mi	t Pa tals	age_ S	<u> </u> of	<u>.                                    </u>	<u>.</u> .			<b>S</b>	REC abi	:RA Net
Client 7/	u	- HAI		7399-6	85			Refrige	rator#	<del></del> .	ı	6	<u> </u>		Γ			6		4	6	4			
Client 7NU- HANFORD B99-085 Est. Final Proj. Sampling Date						#/Tune	Container	Liquid	30	2A6			•			1PC	- }	192	IP	10			Ŀ		
Project # 10985-001-001-9999-00							wiiype	Contamer	Solld															<u> </u>	
Project Conta	ct/Pho	one #						Volume	,	Liquid	40	950	<u> </u>					40	. i	800	11	1L			<u> </u>
RECRA Projec	ct Man	nager <u> </u>	王			•				Solid								<i>i)</i> 147		عمو		24222	,		
ac spec		Del <u>57</u>	D		_	<u> </u>	<u>.</u>	Preserv	ratives		HCL.	OBG	ANIC		ļ			INC	IPG	<del>И</del> АОН	_	H2504			
Date Rec'd	9-:	3 - 99	_ Date Due	10-3.9	èa.			ANALY		-	۸Ö۷			Fe D	Herb			Metal	g	1					
MATRIX						Mat	rix							1		REC	CRA L	abNet	Use	Only		1			
CODES: S - Soll SE - Sediment SO - Solld	Lab ID		Client ID/Description			QC		Matrix	Date Collected	Time Collected	五十十十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二	HSKYO						met0		ISFD	Oharz	INSUR, INHBN		·	
SL - Sludge W - Water O - Oil	001	BOW9PO						W	7-199	0500	3							•							
A - Air DS - Drum	000	1 1					Ţ	1	0634	3	2						7		1	1	1				
Solids DL - Drum	- ·																								
Liquids																									
Leachate WI - Wipe														<u> </u>								<u>.</u>			
X - Other F - Fish																								:	
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		<u> </u>	·							·	<u>.                                    </u>	<u> </u>	<u> </u>							ļ					
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										<u> </u>				*	r										
Special Instructi	ons:	B99-	085			-	CAC	REVISION SC N	15 PH, 1C1 2=1-P	102,10	201 201	,1¢[	eks	tas	ken	. to Agri	(a	Sa (1) (Hr		were:	or or	1) F	C Tape		
COMPOSITE THON							EREVISIONS  TH, ICNO2, ICNO3, ICPOY  (SC 2=1-Proposel, Est.  () =3 ASBA,CD,CR, CW, Pb, ICPO  4 IPH, ICCL, ICFL, ICNO2  5. (CSO4						Ni, SE, 89, VZN 2, 1CHO 3, 1CPCY,					4235 7952 9 A. 2) Amblent or Still 3) Received in Go Condition or			2) Unbr Packag filled 3) Prese			Outer N	
Relinquished			····	<del></del>	Dell	ا ماديا العام	9/9	199 added Be to our p					per PM				4) Pro	Labels operly (	Indicate Preserve	ed . N	Sample Y or				
Ted Cv	1	Received by	Date   9-5-99	71me 0930	nell	P R	D E	RI W	CIII RITI		te	Tin		Sam	ples Lat	es Betw bels and 1? You	d as	5) Received Wi Holding Times			in	Upo	n Sam	ole Rec	it N

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													6	
Bechtel Hanford	Inc. CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST B99-085-03												Õ	
Collector Doug Bowers/Brent Porter		Comp	any Contact is Cearlock	Telephor 372-9	nator	Price Code	7N	Data Turnar						
Project Designation 200 Area Source characterizat	ion - 200-CW-1 OU	- QC Sa Sampl	ling Location East 200 CW1 GP	12 9~1	-94 B	<u></u>	SAF No. B99-085				45 Day			
ice Chest No. DC OLO-1	035	Field	Logbook No. 1511											
Shipped To TMA/RECRA		Offsite	Offsite Property No. A990243 Bill of Lading/Air Bill No. 42357962											
		<del></del>	:	· • · · · · · · · · · · · · · · · · · ·	<u>,</u>		·	COA	320	cui	6716		, <u>.</u>	
POSSIBLE SAMPLE HAZAL	RDS/REMARKS		Preservation	ZnAc+NeOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4	C HNO3 to pH	HCl to pl					
			Type of Container	P	P	P	aG	G/P	aGs*	P				
			No. of Container(s)	1	1		2	2	3	3				
Special Handling and/or Store	nge		Volume	500mL	1000mL	1000mL	1000m	L 1000mL	40mI	S00mL				
	SAMPLE ANA	LYSIS		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VO \$270A (T		VOA - 82 (TCL); VC 8260A (A On) {1 Propano Ethano	OA - Special Add- Instructions. I- DI,				
Sample No.	Matrix *	Sample Date	Sample Time											
B0W9P0	Water	9-1-99	0500						X					
B0W9P1	Water	9-1-99	0630	X	X	X	_ <u>×</u>		LX.	$\perp X$				
<u> </u>		<u> </u>		· ·	· · ·	<u> </u>	<u> </u>		-	<u> </u>				
					<del> </del>				<del>                                     </del>					
CHAIN OF POSSESSION		Sign/Pri	nt Names	J	See (		ly commer	its on SAF for spe				Matrix Soil Water	•	
Relinquished By 1043 Bours  Refin Juish Ri By  LI H A 9		Received By Received By Received By	1 A 9.1-9	ate/Time 9//20 ate/Time 12 SUN924	6 (Wat (2) t Seler	er) - 9040 CP Metals - 60 nium, Silver); I	10A (Supe CP Metals	ertrace) (Arsenic, - 6010A (Supertr	Barium, Cr ace Add-O	, Phosphate, Sulfate admium, Chromium in) (Copper, Nickel	n, Lead,	Vapor Other Solid Other Liquid		
Relinquished by NP Corp A	Date/Time 13 Uitlin 9270 Date/Time	Received By Received By	-eder	ate/Time ate/Time		10 1	elm	WUS!	7	lable sum pl	ęs.			
FEO CX 93  LABORATORY Received By	<u> 5.99 095</u>	OTTO	may 9.399		(le	rom no	0 h	Red or	<u></u>			Date/Time		
SECTION FINAL SAMPLE Disposal Ma	thod					Dîspo	sed By				C	Date/Time	<u></u>	
DISPOSITION		•												

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Chemical and Environmental Measurement Information

#### Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-085

**W.O.** #: 10985-001-001-9999-00

**RFW#:** 9909L006

Date Received: 09-03-99

SDG/SAF #: H0515/B99-085

#### GC/MS VOLATILE

Two (2) water samples were collected on 09-01-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 09-14,15-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. Non-target compounds were detected in these samples.
- 4. One (1) of twenty-four (24) surrogate recoveries were outside EPA QC limits. The matrix spike analyses fulfills the reanalysis requirement for sample B0W9P0.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All RPDs were within EPA QC limits.
- 7. All blank spike recoveries were within EPA QC limits.

8. Both method blanks contained the common laboratory contaminants Methylene Chloride at levels less than 2x the CRQL.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

pef\group\data\ voa\tnu09006.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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#### **GLOSSARY OF VOA DATA**

#### DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10+94\gloss.voa



# **GLOSSARY OF VOA DATA**

## **ABBREVIATIONS**

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions

and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

**DL** = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

mmz\10-94\gloss.voa



#### Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Client: TNU-HANFORD B99-085

RFW Batch Number: 9909L006

\*= Outside of EPA CLP OC limits.

Report Date: 10/15/99 16:58

Work Order: 10985001001 Page: 1a

BOW9P1 VBLKTB VBLKTB BS BOW9P0 BOW9P0 Cust ID: BOW9PO 99LVC200-MB1 99LVC200-MB1 002 001 001 MS 001 MSD RFW#: Sample WATER WATER WATER WATER WATER WATER Information Matrix: 1.00 1.00 1.00 1.00 1.00 D.F. 1.00 UG/L UG/L UG/L UG/L UG/L UG/L Units: ્ટ્ર 95 100 % Toluene-d8 111 \* % 94 왕 90 % 95 ۶ 92 ò 89 % 98 % 94 Bromofluorobenzene 101 Surrogate 90 % 92 96 86 90 1,2-Dichloroethane-d4 Recovery 10 U 1.0 10 10 U Chloromethane 10 IJ 10 U 10 [] 10 Bromomethane\_\_\_\_\_ 10 ΪĴ 1.0 IJ 10 U 10 U 10 U 10 II 10 П 10 IJ 1.0 IJ Vinyl Chloride\_\_\_\_\_ П 10 U 10 U 10 10 Chloroethane\_\_\_\_\_ 10 Ħ 10 П Methylene Chloride\_\_\_\_ 6 JB 6 6 B 5 U 4 5 IJ В Acetone 10 U 10 IJ 10 U 10 U 1.0 10 IJ Carbon Disulfide\_\_\_\_\_ 5 П 5 IJ 5 U. Ū 5 U 82 78 IJ 84 1,1-Dichloroethene\_\_\_\_ IJ 1,1-Dichloroethane\_\_\_\_ 5 U 5 IJ U IJ 1,2-Dichloroethene (total) Ħ IJ ΕŢ Chloroform 5 IJ 5 U IJ 1,2-Dichloroethane\_\_\_\_\_ 5 5 IJ 5 ŦΙ 2-Butanone 10 U 10 U 10 U 10 10 Ħ 10 1,1,1-Trichloroethane\_\_\_\_ IJ 5 Ħ 17 IJ ΤŢ Carbon Tetrachloride\_\_\_\_\_ 5 IJ 5 IJ U IJ IJ Bromodichloromethane U H 1,2-Dichloropropane\_\_\_\_\_ 5 U 5 IJ Ü U 5 U cis-1,3-Dichloropropene\_\_\_\_ 5 ΙŢ П Trichloroethene\_\_\_\_\_ 5 U 11 5 U 98 92 97 Dibromochloromethane \_\_\_\_\_ 5 5 1,1,2-Trichloroethane\_\_\_\_ ΤŢ 5 TT 5 ΙŢ 5 TT IJ Benzene 11 95 91 Trans-1,3-Dichloropropene\_\_\_\_ 5 Ħ 5 U 5 IJ IJ Bromoform ΓŢ 5 4-Methyl-2-pentanone 10 10 10 U 10 1.0 10 2-Hexanone 1.0 U 10 [] 10 10 U 10 U 10 Tetrachloroethene\_\_\_\_ 5 5 5 U 5 U 5 5 U [7 П 1,1,2,2-Tetrachloroethane 5 U U 5 5 U 5 U U Toluene \_\_\_\_\_ 5 U 90 85 90

RFW Batch Number: 99	Cust ID:	BOW9P0		BOW9P0		Work (		10985001 B0W9P1		Page: 1h	2	VBLKTB BS		
	RFW#:	001		001 MS		001 MSI	)	002		99LVC200-1	Œ1	99LVC200-1	<b>1</b> 131	005
Chlorobenzene		5	Ū	102	%	93	%	5	U	5	U	95		
Ethylbenzene		5	U	5	U	5	U	5	U	5	U	5	U	
Styrene		5	U	5	U	5	U	5	Ų	5	U	5	Ų	
Xvlene (total)	···	5	Ü	5	IJ	5	11	5	IJ	5	U	5	ŦĨ	

<sup>\*=</sup> Outside of EPA CLP QC limits.

## Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

RFW Batch Number: 9909L006 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 2a

VBLKRS BS Cust ID: VBLKRS Sample RFW#: 99LVC201-MB1 99LVC201-MB1 WATER WATER Information Matrix: D.F.: 1.00 1.00 Units: UG/L UG/L Toluene-d8 % 93 % 왕 92 è Bromofluorobenzene 89 Surrogate 88 1,2-Dichloroethane-d4 Recovery 10 U Chloromethane Bromomethane\_\_\_\_ 10 U 10 U Vinyl Chloride\_\_\_\_\_ 10 U 10 U Chloroethane\_\_\_\_ 10 U 10 U Methylene Chloride 6 B Acetone \_\_\_\_\_ 10 U 10 U 5 U 5 U Carbon Disulfide 5 U 1,1-Dichloroethene 1,1-Dichloroethane\_\_\_\_ 5 U 5 U 1.2-Dichloroethene (total) 5 U 5 U Chloroform 5 U 5 U 1,2-Dichloroethane 5 U 5 U 2-Butanone\_\_\_\_ 10 U 10 U 5 U ' 1,1,1-Trichloroethane 5 U 5 U Carbon Tetrachloride 5 U Bromodichloromethane 5 U 5 U 1,2-Dichloropropane 5 U cis-1,3-Dichloropropene 5 U 5 U Trichloroethene 5 U 96 ջ IJ Dibromochloromethane 5 U 1,1,2-Trichloroethane 5 U 5 U Benzene 5 U Trans-1,3-Dichloropropene 5 U 5 U Bromoform 5 U 5 U 4-Methyl-2-pentanone\_\_\_\_\_ 10 U 10 U 2-Hexanone 10 U 10 U Tetrachloroethene 5 Ü 5 Ü 1,1,2,2-Tetrachloroethane\_\_\_\_\_ 5 U 5 U Toluene 5 U 89 % \*= Outside of EPA CLP OC limits.

RFW Batch Number: 9909L006 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 2b

Cust ID: VBLKRS

VBLKRS BS

RFW#: 99LVC201-MB1 99LVC201-MB1

Chlorobenzene	5	U	93	8
Ethylbenzene	. 5	U	5	U
Styrene	5	U	5	Ü
Xylene (total)	5	Ų	5	U

<sup>\*=</sup> Outside of EPA CLP QC limits.

1E VOLATILE ORGANICS ANALYSIS SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

B0W9P0		

EPA SAMPLE NO.

Lab Name: Recra.LabNet Contract:	B0W9P0   10985001001
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 9909L006-001
Sample wt/vol: 5.00 (g/mL) ML	Lab File ID: <u>c091411</u>
Level: (low/med) <u>LOW</u>	Date Received: 09/03/99
% Moisture: not dec	Date Analyzed: 09/14/99
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
Number TICs found: 1	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================		======	==========	=====
1.	SILOXANE	19.249	10	JB
		<u></u>		ii

1E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS EPA SAMPLE NO.

BOW9P1	
1	

r.ah	Nama.	Recra.LabNet	
Lab.	name:	Recra.Labnet	

Sample wt/vol: 5.00 (g/mL) ML

Contract: <u>10985001001</u>

Lab	Code:	Recra	Case No.:		SAS No.	:	SDG	No.:	
				<del></del>	0110 140.	•	UDU	140	

Matrix: (soil/water) WATER Lab Sample ID: 9909L006-002

Level: (low/med) <u>LOW</u> Date Received: <u>09/03/99</u>

% Moisture: not dec. \_\_\_\_ Date Analyzed: 09/15/99

Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:

Lab File ID: <u>c091507</u>

Number TICs found: 3 (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
-   -	=========	=======================================	======		=====
	1.	SILOXANE	18.063	6	J
	2.	SILOXANE	19.270	20	JB
	3.	SILOXANE	23.046	10	J
Ι.	·		<u> </u>		İİ

1E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.	
.——			

Lab Name: Recra.LabNet Contract: 10	VBLKTB 0985001001	
Lab Code: Recra Case No.:	SAS No.: SDG No.:	
Matrix: (soil/water) <u>WATER</u>	Lab Sample ID: 99LVC200-MB1	
Sample wt/vol: _5.00 (g/mL) ML	Lab File ID: <u>c091409</u>	
Level: (low/med) <u>LOW</u>	Date Received: 09/19/99	
% Moisture: not dec	Date Analyzed: <u>09/14/99</u>	
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00	
	ONCENTRATION UNITS: ug/L or ug/Kg) <u>UG/L</u>	
CAC NUMBER COMPOSTED NAME	DE LONG COVE	

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	======================================	======	=========	====
1.	SILOXANE	19.280	8	J
				ii

1E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	EPA	SAMPLE	NO.	
1				 
1	VBLK	28		1 ]

	VBLKRS
Lab Name: Recra.LabNet Contract:	10985001001
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 99LVC201-MB1
Sample wt/vol: _5.00 (g/mL) ML	Lab File ID: <u>c091504</u>
Level: (low/med) LOW	Date Received: 09/15/99
% Moisture: not dec.	Date Analyzed: 09/15/99
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
Number TICs found: 1	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>

CAS NUMBER	. COMPOUND NAME	RT	EST. CONC.	Q
======================================		======		====
1.	SILOXANE	19.248	10	J
[		<u> </u>		ll

# Recra LabNet - Lionville Laboratory VOA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-085

DATE RECEIVED: 09/03/99 RFW LOT # :9909L006

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
	<del></del>					
B0W9P0	001	W	99LVC200	09/01/99	N/A	09/14/99
B0W9P0	001 MS	W	99LVC201	09/01/99	N/A	09/15/99
B0W9P0	001 MSD	W	99LVC201	09/01/99	N/A	09/15/99
B0W9P1	002	W	99LVC201	09/01/99	N/A	09/15/99
LAB QC:						
				27 / 2	37 / T	00/14/00
VBLKTB	MB1	W	99LVC200	A\N	A\N	09/14/99
VBLKTB	MB1 BS	M	99LVC200	N/A	N/A	09/14/99
VBLKRS	MB1	W	99LVC201	N/A	N/A	09/15/99
VBLKR\$	MB1 BS	W	99LVC201	N/A	N/A	09/15/99

PECRA Lab		×/ 0	Custo & F	Ody 1									Re	equ (§)	mi	tals	ge_	<u> </u>	f <u> </u>	<del>-</del> .			RE La	ECRA abNe
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Client 7NU- HANFORD 399-085				neirige	II ALUE #	Liquid	34	2A6			1.			ipe	<del>├──</del>	10	IP	10		<del>-P</del>				
Est. Final Proj. Sampling Date				#/Туре	Container	Solid	DAT	92/10			<del> </del> -			110		1150	11	111		<del></del>				
			1-4117	- 00					<del> </del>	Liquid	40	950						100	:	920	IL	11_	$\overline{}$	+
Project Conta		nager					<del></del>	Volume	•	Solid	1	70-	<del> </del>					<del></del>	<del>                                     </del>	<del>  200</del>			$\dashv$	
ac Spec	ct mar	Del <u>570</u>	TAT _	301	سهر		•	Preser	vatives		HCL				<b> </b>			WO 3	7	NAOH	_	4/2504		<del>                                      </del>
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ł	<u>_7".</u>	3 - 99	Date Due	10-3.	35			ANALY REQUE		<del></del>	Š	BNA	Pest/ PCB	Herb				Metal	ક					
Account #	Ī	1				u.	trix			I	+		L <u></u> -	1	<u> </u>	REC	RA L		Use	Only	<u> </u>	<del>                                     </del>		
MATRIX CODES: S - Soil SE - Sediment SO - Solid	Lab ID	C	Client ID/Desc	ription		Cho (6	sen /)	Matrix	Date Collected	Time Collected	H+K90	// V						MeT@		ISFD	Oxanz	INBUR, INHBN		
SL - Sludge W - Water	001	BOWS	9 Po			1113	man	W	7-1-99	0500	3										1.2			
A - Air	000	1	1					1	1	0634	3	2						1		1	1	7	_	
DS - Drum Solids		1						. <del>.:: -</del> .		000	1			-	-					1				<del></del>
DL - Drum Liquids	<u> </u>			····					1		1													
L - EP/TCLP Leachate		1							<del> </del>		<del> </del>													
WI - Wipe X - Other										<del></del>	1												-	_
F - Fish			·						<del> </del>		<del> </del>	<del> </del>												_
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Special Instruct	lons:	<u> </u>		<del> </del>		لـــا	DATE/	REVISION	<sup>IS</sup> O		<u></u>	1						<u></u>	<u> </u>	REC	RA Lai	Net Use	Only	
sal	3.#	B99-0	85			•	050	» SC Λ	1 PH, IC. 2=1-P 3 AS, B	ropa	nol,	Icf E-	eka	rol	Ren	to Agric	13	Sa IN 1)		were:	OT	COC 1) Pre	Tape wa	Outer
		_		TTE		M	ol (	<u> </u>	3 <u>AS</u> , B	A <sub>J</sub> CD,S	R, C	w, M	<u>6, N</u>	<u>i, 5</u>	E, 3	9, 1,	<u>_                                    </u>	A.	4235	7952 9	<b>657</b>	' 2) Un	brokep o	գր Outer
		·	OMPOS WASTI	: :		1	MOL	<u> </u>	4.1PH.S	CCL, 10	CFL	Ica	102.	ICA	63,	ICPO	34.	2)		nt or Off		3) Pre	age Y esent_on	∕or N Sample
			117011	-			•		5. <u>1050</u>	4	•		•		•		,	3) Co	Receive ndition	ed in Go	Doc N		esent on	)or N
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FedCx		Whach	9:599	0930	<b> </b>	R		WAY!	ורוכ					NOT			_			Ø or	N	Temp.	2.5	. ·с

Bechtel Hanford Inc	e. Och	CI	HAIN OF CUST	ODY/S	AMPLE	ANALY	YSIS I	REQUEST	r	В9	9-085-03	Page 1	of <u>1</u>	
Collector			any Contact	Telephor	e No.			Project Coordi FRENT, SJ	nator P	rice Code	7N	Data Turnaround		
Doug Bowers/Brent Porter Project Designation 200 Area Source characterization	- 200-CW-1 OI I - OC	Sampl	is Cearlock ing Location East 200 CW1 GP; 6		<u> </u>			SAF No. 399-085				45 Days		
Ice Chest No. PLC OLO-C		Field I	Logbook No. 1511	<u> </u>	77.0	Method of Shipment Federal Express								
Shipped To TMA/RECRA	·	Offsite	Property No.	19024	Air Bill No.	3570	629	1057						
			1	=				COA	200	, w j	6716	,		
POSSIBLE SAMPLE HAZARD	S/REMARKS	:	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 40	HNO3 to pH	HCl to pH <2 Cool 4C	HNO3 to pH				
			Type of Container	P	P	P	aG	G/P	aGs*	P				
· ·			No. of Container(s)	ı	1	-	2	2	3	3				
Special Handling and/or Storage		Volume	500mL	1000mL	1000mL	1000ml	L 1000mL	40mL	500mL					
	SAMPLE ANALYS	sis		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 3\$3.1; Ammonia - 350.3	Semi-VO/ 8270A-(T6		VOA - 8260A (TCL); VOA - 8260A (Add- On) {1- Propanol, Ethanol}	See item (2) in Special Instructions.				
Sample No.	Matrix *	Sample Date	Sample Time					8 84 68					7	
B0W9P0	Water	9-1-99	0500						X		<u> </u>			
B0W9P1	Water 6	9-1-99	0630	X	X	X	X		X	X	-			
		<u>.</u>		<u> </u>	· ·	·	-					<del>                                     </del>		
				<u> </u>					<del></del>					
CHAIN OF POSSESSION	D. C.	Sign/Prin	nt Names	ate/Timje	te}; pH	Matrix Soil Water	•							
Relinquished By 1003, 800 13  Relinquished By  HA 92	Date/Time  Date/Time  Date/Time  On 1230		1 A 9.1-9	9//20 ate/Time 12 Sun9/2/	(Wat (2) 1 Select	er) - 9040 CP Metals - 601 ium, Silver); 10	10A (Supe CP Metals	rtrace) {Arsenic, l - 6010A (Supertra	Barium, Cadm	nium, Chromiu (Copper, Nicke	ım, Lead,	Vapor Other Solid Other Liquid		
Relinquished By	Date/Time (380) Date/Time Date/Time	Received By Received By	eder	ate/Time	_   -	to le	im	una	7 50	imp	us.			
LABORATORY Received By	99 0930	TING	may 9:399	0930 it		rom no	<u>0 h  </u>	Rod ar	ra			Date/Time		
SECTION FINAL SAMPLE Disposal Metho	d	<u> </u>	· · · · · · · · · · · · · · · · · · ·			Dispos	sed By	<del></del>			1	Date/Time	·	